

# CLINICAL AND EPIDEMIOLOGICAL SURVEILLANCE OF A POPULATION CONTAMINATED BY BETA-HEXACHLOROCYCLOEXANE FROM AN ILLEGAL CHEMICAL DUMPING SITE

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**Background and Aims:** The health effects associated to Beta-hexachlorocyclohexane (Beta-HCH), an organochlorine isomer of lindane, are still unclear. Potential effects on hormonal function, diabetes, cardiovascular, neurological, liver, renal, and reproductive disorders have been hypothesized. A population living close to the Sacco River Valley in central Italy has been exposed via food contamination from an illegal dumping site of a chemical industry producing pesticides. A programme of clinical and epidemiological surveillance has been going on since 2009. The objective of the study was to analyze the relationship between blood levels of Beta-HCH and some biochemical parameters.

**Methods:** A total of 495 people (48% of females), living within 1 km from the Sacco River, underwent an interview and a blood sampling for the detection of Beta-HCH and biochemical analyses (TSH, FT3, FT4, Cortisol, Transaminase, GammaGT, HDL-Cholesterol, Creatinine, Azotemia, Glycemia, Glycosylated Hemoglobin, Fibrinogen, FSH, LH, Prolactin, Testosterone). The association between Beta-HCH levels and each parameter was investigated using logistic regression (cut-off the 10<sup>th</sup> or 90<sup>th</sup> centile of the distribution) considering clustering within families. The analyses were done separately for gender, adjusting for age, educational level, breast-feeding (for women) and thyroid therapy (for TSH, FT3, FT4).

**Results:** The population had an average high level of Beta-HCH (geometric mean=80, GSD=1.2 ng/g lipids). In females, there was a clear association of Beta-HCH (per 100 ng/g lipids) with high TSH (OR: 1.38, 95%CI: 1.12-1.69), FT3 (OR: 1.25, 95%CI: 0.99-1.57), LH (OR: 1.31, 95%CI: 0.99-1.73), and low HDL (OR: 1.31, 95%CI: 1.08-1.58). In males, a no clear inverse association was found for FT3 (OR: 0.73, 95%CI: 0.54-0.99) and GammaGT (OR: 0.77, 95%CI: 0.59-0.99).

**Conclusions:** A clear effect of Beta-HCH on the thyroid regulation and function was suggested in females. The surveillance of the population is on-going and additional data will be available to confirm these results.